

What Is Claimed Is:

1. A layer system having a silicon layer, on which at least regionally a passivating layer (17) is superficially deposited,  
wherein the passivating layer (17) has a first, at least largely inorganic partial layer (14) and a second, at least largely polymer partial layer (15).
2. The layer system as recited in Claim 1,  
wherein the first partial layer (14) is at least largely made of an oxide layer, particularly silicon oxide.
3. The layer system as recited in Claim 1 or 2,  
wherein the first partial layer (14) has a thickness of 1 nm to 100 nm, in particular 5 nm to 30 nm.
4. The layer system as recited in one of the preceding claims,  
wherein the first partial layer (14) is deposited directly on the silicon layer (11) or on a layer made of silicon oxide situated on the silicon layer (11).
5. The layer system as recited in one of the preceding claims,  
wherein the second partial layer (15) is at least largely a Teflon layer or a Teflon-like layer.
6. The layer system as recited in one of the preceding claims,  
wherein the second partial layer (15) has a thickness of 30 nm to 800 nm, in particular 50 nm to 400 nm.
7. The layer system as recited in one of the preceding claims,

wherein the passivating layer (17) is a layer protecting the silicon layer (11) against an etch attack by a gaseous halogen fluoride such as  $\text{ClF}_3$  or  $\text{BrF}_3$ .

8. The layer system as recited in one of the preceding claims,

wherein the passivating layer (17) is free of microscale or nanoscale channels that are pervious to a gas such as  $\text{ClF}_3$  or  $\text{BrF}_3$  or a vapor.

9. The layer system as recited in one of the preceding claims,

wherein within the passivating layer (17) at least regionally an intermediate layer situated between the first partial layer (14) and the second partial layer (15) and adjoining both partial layers (14, 15) is provided, the intermediate layer having a composition such that in its surface area adjoining the first partial layer (14) it is composed at least approximately as the first partial layer (14) and in its surface area adjoining the second partial layer (15) it is composed at least approximately as the second partial layer (15), and the composition of the intermediate layer passing over, continuously or in steps, from the composition at least approximately corresponding to the first partial layer (14) to the composition at least approximately corresponding to the second partial layer (15).

10. The layer system as recited in Claim 9,

wherein the intermediate layer contains silicon, oxygen, carbon and fluorine.

11. The method for producing a passivating layer on a silicon layer, in particular a layer system as recited in one of the preceding claims,

a first, at least largely inorganic partial layer (14) being produced, at least regionally, on the silicon layer (11), an intermediate layer being produced, at least regionally, on the first partial layer (14) and an at least largely polymer partial layer (15) being produced, at least regionally, on the intermediate layer to form the passivating layer (17), and the production of the intermediate layer occurring in such a way that the intermediate layer in its surface area adjoining the first partial layer (14) is composed at least approximately as the first partial layer (14) and in its surface area adjoining the second partial layer (15) is composed at least approximately as the second partial layer (15) and that the composition of the intermediate layer passes over, continuously or in steps, from the composition corresponding at least approximately to the first partial layer into the composition corresponding at least approximately to the second partial layer.

12. The use of the layer system or of the method as recited in one of the preceding claims in the production of at least largely or regionally self-supporting structures in silicon, particularly through the temporary use of an anisotropic etching technique in silicon and the temporary use of an isotropic etching technique in silicon.